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McKay

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(54) **BONE IMPLANTS AND METHODS
COMPRISING DEMINERALIZED BONE
MATERIAL**

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(58) **Field of Classification Search**
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See application file for complete search history.

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days. days.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,531,791	A	7/1996	Wolfmberger et al.
7,498,041	B2	3/2009	Masinaei et al.
7,815,682	B1	10/2010	Peterson et al.
2002/0120338	A1	8/2002	Boyer, II et al.
2003/0009235	A1	1/2003	Manrique et al.
2003/0114936	A1	6/2003	Sherwood et al.
2003/0167092	A1	9/2003	Foley
2005/0021142	A1	1/2005	Ganz et al.
2005/0085922	A1	4/2005	Shapple et al.
2005/0251266	A1	11/2005	Maspero et al. 623/23.51
2006/0233851	A1	10/2006	Simon et al.
2006/0280803	A1	12/2006	Kumar et al.

(Continued)

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(57) **ABSTRACT**

Bone implant compositions and methods are provide that have an outer surface, the outer surface comprising demineralized bone and having a cavity disposed in the outer surface, the cavity having a demineralized bone material coated therein; and an inner surface of the bone implant comprising cortical bone, the inner surface contacting the outer surface. The bone implant compositions and methods provided are osteoinductive and allow rapid bone fusion.

6 Claims, 3 Drawing Sheets

